

REMARKS

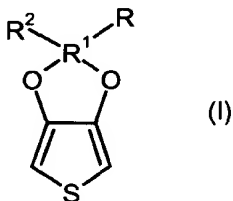
Reconsideration of the application is requested in view of the remarks below.

Rejection Under 35 USC 102

The Office Action rejected Claims 10-11 under 35 USC 102 over Jonas et al '926 (Jonas 926) or '042 (Jonas 042) or '430 (Jonas 430).

It is well settled that in order for a prior art reference to anticipate claim, the reference must disclose each and every element of claim with sufficient clarity to prove its existence in prior art. The disclosure requirement under 35 USC 102 presupposes knowledge of one skilled in art of claimed invention, but such presumed knowledge does not grant license to read into prior art reference teachings that are not there. See *Motorola Inc. v. Interdigital Technology Corp.* 43 USPQ2d 1481 (1997 CAFC).

Applicants' invention as encompassed by Claims 10 and 11, relates to a polythiophene obtained with the process of Claim 1, in which the polythiophene is a solid, a dispersion or a solution. In one embodiment, the polythiophene is a conductive coating or an anti-static coating. The process of Claim 1 involves (1) reacting (a) one or more thiophenes of the general formula (I)



in which R^1 is an unsubstituted or substituted alkylene or an alkenylene radical having from 1 to 10 carbon atoms, and R and R^2 , independently of one another, are hydrogen, a linear or branched alkyl radical having from 1 to 20 carbon atoms, OH, O-CH₂-CH₂-CH₂-SO₃H or O-alkyl having 1-18 carbon atoms, (b) at least one compound containing one or more sulfonic acid groups, (c) at least one oxidant, (d) at least one phase-transfer catalyst, and (e) optionally one or more catalysts, other than the at least one phase-transfer catalyst (d) with (f) at least one

anhydrous or low-water-content solvent at a temperature ranging from 0 to about 150°C, thereby forming a product, and (2) subsequently working up the product.

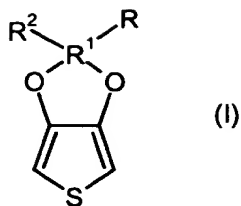
None of the cited references anticipate Applicants' invention. Since the polythiophenes obtained with the process according to Applicants' invention are prepared in the presence of at least one compound containing one or more sulfonic acid groups, preferably polysulfonic acid(s), those polythiophenes as claimed in Claims 10 or 11 (as a solid, dispersion or solution) encompass compound(s) containing one or more sulfonic acid groups. Since the polythiophenes of the Jonas references do not disclose the addition of such compounds, the polythiophenes of Applicants' invention are of different chemical composition and, consequently, the rejected claims are not anticipated by the cited references. Reconsideration is requested.

Rejection Under 35 USC 103

The Office Action rejected Claims 1-9 under 35 USC 103 over Jonas et al '926 (Jonas 926) or '042 (Jonas 042) or '430 (Jonas 430). The rejection should be withdrawn in view of the remarks below.

It is well settled that to establish a *prima facie* case of obviousness, the USPTO must satisfy all of the following requirements. First, the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, must contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references. *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). Second, the proposed modification must have had a reasonable expectation of success, as determined from the vantage point of one of ordinary skill in the art at the time the invention was made. *Amgen v. Chugai Pharmaceutical Co.* 18 USPQ 2d 1016, 1023 (Fed Cir, 1991), *cert. denied* 502 U.S. 856 (1991). Third, the prior art reference or combination of references must teach or suggest all of the limitations of the claims. *In re Wilson*, 165 USPQ 494, 496, (CCPA 1970).

Applicants' invention as encompassed by Claim 1, relates to a process involving (1) reacting (a) one or more thiophenes of the general formula (I)



in which R^1 is an unsubstituted or substituted alkylene or an alkenylene radical having from 1 to 10 carbon atoms, and R and R^2 , independently of one another, are hydrogen, a linear or branched alkyl radical having from 1 to 20 carbon atoms, OH, $O-CH_2-CH_2-CH_2-SO_3H$ or O-alkyl having 1-18 carbon atoms, (b) at least one compound containing one or more sulfonic acid groups, (c) at least one oxidant, (d) at least one phase-transfer catalyst, and (e) optionally one or more catalysts, other than the at least one phase-transfer catalyst (d) with (f) at least one anhydrous or low-water-content solvent at a temperature ranging from 0 to about $150^\circ C$, thereby forming a product, and (2) subsequently working up the product.

One of ordinary skill in the art following the teachings of the cited references would not have been motivated to modify the reference, practice Applicants' invention and expect results Applicants have discovered. The cited references teach a process for the preparation of polythiophenes of the formula (I) by oxidative polymerization of 3,4-disubstituted thiophenes of the formula (II) at temperatures from 0 to $200^\circ C$, depending on the oxidants used. An organic solvent such as given in Column 3, lines 50 - 65 (Jonas '430), can be used in the taught process as well as oxidants, such as given in Col. 4, lines 2 - 7 (Jonas '430).

There are several significant differences between the process taught in the cited references and Applicants' invention. Unlike the process taught by the Jonas references, Applicants' invention requires the use of at least one compound (b) containing one or more sulfonic acid groups in addition to (c) (at least one oxidant). Examples of such compounds are given on page 6, lines 14 - 25, and polysulfonic acids are preferred. In the Jonas references the only compounds containing such groups are iron salts of alkylsulfonic acids which the Office Action quoted therefrom but these compounds are used as the oxidants in the process taught in those references. By contrast, the compound(s) containing one or more sulfonic acid groups according

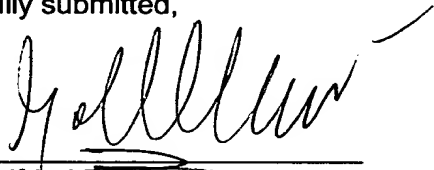
to the present invention are used as dispersing agents in the inventive process and have no oxidative features, since additional oxidants are used.

Additionally, one of the most important features of Applicants' invention is the use of (d) at least one or more phase-transfer catalyst(s) in order to increase the solubility of the oxidants in the solvent (see Claim 1 and page 7, lines 1 - 15). Surprisingly, the addition of such phase-transfer catalysts increases not only the reaction rate during the polymerization, but also the solubility of the polythiophenes obtained according to this inventive process (see p. 4, lines 1 - 8). Increase of the reaction rate as a consequence of the use of a phase-transfer catalyst is shown in Example 2 in comparison to Comparative example 1 of the pending application. Example 2 shows a reaction rate of 95.1 % within 24 h, whereas in Comparative example 1, no reaction can be observed within 24 h and even within one week only a reaction rate of 2.5 % can be measured. The process according to the present invention is significantly different from that disclosed in the cited references. Reconsideration is requested.

In view of the foregoing amendments and remarks, Applicants request that the USPTO acknowledge the differences that exist between their invention and the inventions taught by the prior art, withdraw the rejections, and allow all pending claims.

Respectfully submitted,

By


Godfried R. Akorli
Attorney for Applicants
Reg. No. 28,779

Bayer Chemicals Corporation
100 Bayer Road
Pittsburgh, Pennsylvania 15205-9741
(412) 777-3061
FACSIMILE PHONE NUMBER:
(412) 777-2612

s:/sr/akorli/gra0427